

Laparoscopic Lavage Versus Primary Resection for Acute Perforated Diverticulitis

Review and Meta-analysis

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Objective: To compare clinical outcomes after laparoscopic lavage (LL) or colonic resection (CR) for purulent diverticulitis.

Background: Laparoscopic lavage has been suggested as an alternative treatment for traditional CR. Comparative studies to date have shown conflicting results.

Methods: Electronic searches of Embase, Medline, Web of Science, and Cochrane databases were performed. Weighted mean differences (WMD) were calculated for effect size of continuous variables and pooled odds ratios (POR) calculated for discrete variables.

Results: A total of 589 patients recruited from 3 randomized controlled trials (RCTs) and 4 comparative studies were included; 85% as Hinchey III. LL group had younger patients with higher body mass index and lower ASA grades, but comparable Hinchey classification and previous diverticulitis rates. No significant differences were noted for mortality, 30-day reoperations and unplanned readmissions. LL had higher rates of intraabdominal abscesses (POR = 2.85; 95% confidence interval, CI, 1.52–5.34; $P = 0.001$), peritonitis (POR = 7.80; 95% CI 2.12–28.69; $P = 0.002$), and increased long-term emergency reoperations (POR = 3.32; 95% CI 1.73–6.38; $P < 0.001$). Benefits of LL included shorter operative time, fewer cardiac complications, fewer wound infections, and shorter hospital stay. Overall, 90% had stomas after CR, of whom 74% underwent stoma reversal within 12-months. Approximately, 14% of LL patients required a stoma; 48% obtaining gut continuity within 12-months, whereas 36% underwent elective sigmoidectomy.

Conclusions: The preservation of diseased bowel by LL is associated with approximately 3 times greater risk of persistent peritonitis, intraabdominal abscesses and the need for emergency surgery compared with CR. Future studies should focus on developing composite predictive scores encompassing the wide variation in presentations of diverticulitis and treatment tailored on case-by-case basis.

Keywords: perforated diverticulitis, purulent, laparoscopic lavage, colonic resection, hinchey classification, trials

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Colonic diverticular disease is a common condition with an estimated annual hospital admission rate of 209 per 100,000 adults in Europe.¹ Up to 35% of patients will have perforated disease

with purulent or fecal contamination, classified as Hinchey III or IV, respectively.^{1–4} Historically, the open Hartmann's procedure was the most commonly performed operation in these patients with high rates of morbidity (25%–75%) and mortality (2%–30%).^{5,6} Furthermore, less than 50% of patients would ever have their stoma reversed.

Since the mid-1990s, alternative approaches to perforated diverticular disease have been adopted increasingly, including colonic resection (CR) with primary anastomosis with or without defunctioning stoma, and nonresectional strategies such as laparoscopic lavage (LL) and drainage. A retrospective population study⁷ using the Irish national database found that 17% (427/2455) of patients who underwent surgery for diverticulitis between the years 1995 and 2008 were managed by LL alone. These patients had a shorter length of hospital stay and lower complication rates than those undergoing open resectional surgery. In 2008, a prospective multi-institutional study conducted by Myers et al,⁸ managed 92 out of 100 patients presenting with perforated diverticulitis and generalized peritonitis by LL alone. The overall postoperative morbidity and mortality rates were only 4% and 3%, respectively.

To date, 3 randomized controlled trials and 4 comparative studies comparing LL with CR (open or laparoscopic Hartmann's or resection with primary anastomosis with or without defunctioning stoma) for acutely perforated diverticulitis have reported their results.^{9–16} In this article, we present the results of a systematic review and meta-analysis of these studies.

METHODS

Literature Search Strategy

An electronic search was performed using Embase, Medline, Web of Science, and Cochrane (2014 Issue 3) databases from January 1990 to December 2016, to identify studies comparing LL with CR for acute perforated diverticulitis. The search terms “diverticular disease,” “perforated,” “diverticulitis,” “laparoscopic lavage,” “peritoneal lavage,” “Hartmann's,” and “primary resection” and Medical Subject Headings (MESH) “diverticular disease” (MESH), “diverticulitis” (MESH), “laparoscopic lavage” (MESH), and “resection” (MESH) were used in combination with the Boolean operators AND or OR. The electronic search was supplemented by a hand-search of published abstracts from meetings of the Surgical Research Society, the Society of Academic and Research Surgery, the Association of Surgeons of Great Britain and Ireland, Association of Coloproctologists of Great Britain and Ireland, American Society of Colon and Rectal Surgeons, Society for Surgery of the Alimentary Tract, Association of Laparoscopic Surgeons of Great Britain and Ireland, Society of American Gastrointestinal and Endoscopic Surgeons and European Association of Endoscopic Surgeons from 2000 to 2016. The reference lists of articles obtained were also searched to identify further relevant citations. Finally, the search included the Current Controlled Trials Registry (<http://www.controlled-trials.com>).

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